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EXAMINER	
CHORBAJI, MONZER R	
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1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/530,361	MORUZZI, GUIDO	
	Examiner	Art Unit	
	MONZER R. CHORBAJI	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *33-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *33-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This final action is in response to the amendment received on 12/22/08

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 33, 35, 37, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374).

Regarding claim 33, Ernstsson discloses a method for sterilizing (col.1, lines 7-8) packaging sheet material in a filling machine (col.3, lines 28-30), the method comprising in the following order: applying a hydrogen peroxide solution to the surface of a packaging sheet material (col.4, lines 60-63 and figure 3:28 and 29) while microorganisms on the surface of the packaging sheet material (the specification only teaches of microorganisms without providing any significance and one of ordinary skill

in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that absorb the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives) absorb hydrogen peroxide; removing a substantial amount of hydrogen peroxide (col.5, lines 2-3 and figure 3:30) from the surface of said packaging material while retaining a residual or trace quantity of hydrogen peroxide absorbed by microorganisms present on said packaging material (the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that absorb the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives); and irradiating said packaging material retaining a residual or trace quantity of hydrogen peroxide absorbed by microorganisms present on said packaging material with UV light (col.3, lines 65-66 and figure 3:11; the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that have absorbed the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives).

Ernstsson fails to disclose concentration values for liquid hydrogen peroxide. Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1, lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to

55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with liquid hydrogen peroxide having concentration values between 1% to 55% by weight, since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light as explained by Sizer (col.3, lines 16-20).

Regarding claim 40, Ernstsson teaches a method for rendering microorganisms present on the surface of packaging material non-viable (col.1, lines 7-8), the method comprising, in the following order: advancing continuously (figure 3:27, 46, 48, 49 and 40) said packaging material through a bath (col.4, lines 60-63 and figure 3:28 and 29) of liquid hydrogen peroxide having an un disclosed concentration; removing (col.5, lines 2-3 and figure 3:30) a substantial amount of hydrogen peroxide from the surface of said packaging material while retaining a residual or trace quantity of hydrogen peroxide absorbed by microorganisms present on said packaging material (the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that absorb the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives); and directing UV light (col.3, lines 65-66 and figure 3:11) onto the surface of said packaging sheet material while said residual or trace quantity of hydrogen peroxide remains (considered as being absorbed by the microorganisms) on

said packaging material (the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that have absorbed the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives).

Ernstsson fails to disclose concentration values for liquid hydrogen peroxide. Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1, lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to 55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with liquid hydrogen peroxide having concentration values between 1% to 55% by weight, since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light as explained by Sizer (col.3, lines 16-20).

Regarding claim 35, Ernstsson fails to disclose a value for the motion of the packaging material. Sizer discloses that the preferred motion rate for sterilizing the material is 20 cm/s (col.7, lines 28-30). However, Ernstsson further disclose that this motion rate varies depending on the material (col.7, lines 30-32). For example, thick packaging material are sterilized and assembled at lower operating rate than thin material in order to insure a certain depth within the material has been sterilized

whereas thin packaging material are moved through the form, fill and seal machine at higher operating rate. As such one recognizes based upon the teachings of Sizer that is modifying the operating rate (considered as the result-effective variable) is an obvious matter of routine experimentation.

Regarding claim 37, Ernstsson teaches that the packaging sheet material is hydrophobic (col.5, lines 46-62).

Regarding claim 42, Ernstsson fails to disclose concentration values for liquid hydrogen peroxide. Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1, lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to 55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with liquid hydrogen peroxide having concentration values between 1% to 55% by weight, since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light as explained by Sizer (col.3, lines 16-20).

4. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374) as applied to claim 33 and further in view of Loliger et al. (U.S.P.N. 3,692,468).

Ernstsson fails to teach irradiating with a UV light having a wavelength between about 200nm and 320nm and a hydrogen peroxide solution having a temperature between 15 ^{0}C and 80 ^{0}C for a time interval of from 0.5 seconds to 2 seconds.

Sizer irradiates the exterior surfaces of packaging material with KrCl excimer lamp (col.3, lines 4-6 and lines 8-9) at a wavelength of 222 nm (col.7, lines 36-38) in order to provide a uniform sterilization of the material (col.4, lines 9-10). In addition, Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1, lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to 55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with the KrCl excimer UV lamp because KrCl excimer UV lamps provide uniform sterilization of the material as shown by Sizer (col.4, lines 9-10).

Sizer fails to teach that liquid hydrogen peroxide has a temperature between 15 ^{0}C and 80 ^{0}C for a time interval of from 0.5 seconds to 2 seconds.

Loliger sterilizes the surfaces of contaminated strip material by immersing it in a hydrogen peroxide bath heated to a temperature of 60 ^{0}C (col.2, lines 68-70, figure 1:15 and 10), because it is known at such a temperature kills even heat-resisting germs (col.1, lines 31-33). As to the limitation of immersing the packaging sheet material for a time interval of from 0.5 seconds to 2 seconds, Loliger recognizes that long immersion time of the packaging material in the liquid hydrogen peroxide is detrimental to the

material (col.4, lines 9-13). Specifically, Loliger provides an example of a time interval of 7 seconds at an exemplary speed where the strip moving at speed of 30 cm/second (col.3, lines 56-60). Loliger teaches that the depth of the immersion is lessened in the presence of highly heated and highly concentrated hydrogen peroxide solution (col.4, lines 19-21) such that one of ordinary skill in the art would readily recognize that as the temperature and concentration of hydrogen peroxide change so does the immersion time. The disclosure as a whole does not provide any critical showing to the claimed immersion time interval and absent any evidence of criticality, decreasing or increasing the immersion time of the packaging material in the liquid hydrogen peroxide is a matter of routine experimentation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified method in Ernstsson/Sizer with the heated hydrogen peroxide solution, because it is known that hydrogen peroxide solution heated to a 60 ^{0}C temperature kills even heat-resisting germs as shown by Loliger (col.1, lines 31-33).

5. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374) and further in view of Loliger et al. (U.S.P.N. 3,692,468) and DiGeronimo (U.S.P.N. 4,494,357).

Regarding claim 43, Ernstsson discloses a method for sterilizing (col.1, lines 7-8) a packaging sheet material comprising, in the following order: applying a liquid solution of hydrogen peroxide to the surface of a packaging sheet material (col.4, lines 60-63 and figure 3:28 and 29), and thereafter; applying a stream of air to said packaging sheet

material (col.5, lines 2-3 and figure 3:30) so as to remove a substantial amount of said hydrogen peroxide from the surface of said packaging sheet material while retaining only a trace quantity of hydrogen peroxide absorbed by microorganisms present on said packaging sheet material (the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that absorb the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and after the step of applying the air knives), and thereafter irradiating the surface of said packaging sheet material with UV light (col.3, lines 65-66 and figure 3:11; the specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that have absorbed the residual hydrogen peroxide left after having web 3 immersed in liquid hydrogen peroxide and also left after the step of applying the air knives) having an undisclosed wavelength value while said packaging sheet material retains said trace quantity of hydrogen peroxide (considered as the residual hydrogen peroxide that have been absorbed by microorganisms present on surfaces of web 3); wherein applying hydrogen peroxide to the packaging sheet material comprises immersing said packaging sheet material in a hydrogen peroxide solution (col.4, lines 60-63 and figure 3:28 and 29) at an undisclosed temperature value, for an undisclosed time interval; wherein removing a substantial amount of hydrogen peroxide from the packaging sheet material comprises blowing a stream of air that is heated to at an

undisclosed temperature onto the packaging sheet material; and wherein said packaging sheet material is hydrophobic (col.5, lines 46-62).

Ernstsson fails to teach the following: irradiating with a UV light having a wavelength between about 200nm and 320nm; hydrogen peroxide solution having a concentration of 10% to 50% at a temperature between 15 ^{0}C and 80 ^{0}C for a time interval of from 0.5 seconds to 2 seconds; and said stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C.

Sizer irradiates the exterior surfaces of packaging material with KrCl excimer lamp (col.3, lines 4-6 and lines 8-9) at a wavelength of 222 nm (col.7, lines 36-38) in order to provide a uniform sterilization of the material (col.4, lines 9-10). In addition, Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1, lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to 55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with the KrCl excimer UV lamp because KrCl excimer UV lamps provide uniform sterilization of the material as shown by Sizer (col.4, lines 9-10) and to further provide the method in Ernstsson with liquid hydrogen peroxide having concentration values between 1% to 55% by weight, since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light as also explained by Sizer (col.3, lines 16-20).

Sizer fails to teach that liquid hydrogen peroxide has a temperature between 15 ^{0}C and 80 ^{0}C for a time interval of from 0.5 seconds to 2 seconds; and that said stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C.

Loliger sterilizes the surfaces of contaminated strip material by immersing it in a hydrogen peroxide bath heated to a temperature of 60 ^{0}C (col.2, lines 68-70, figure 1:15 and 10), because it is known at such a temperature kills even heat-resisting germs (col.1, lines 31-33). As to the limitation of immersing the packaging sheet material for a time interval of from 0.5 seconds to 2 seconds, Loliger recognizes that long immersion time of the packaging material in the liquid hydrogen peroxide is detrimental to the material (col.4, lines 9-13). Specifically, Loliger provides an example of a time interval of 7 seconds at an exemplary speed where the strip moving at speed of 30 cm/second (col.3, lines 56-60). Loliger teaches that the depth of the immersion is lessened in the presence of highly heated and highly concentrated hydrogen peroxide solution (col.4, lines 19-21) such that one of ordinary skill in the art would readily recognize that as the temperature and concentration of hydrogen peroxide change so does the immersion time. The disclosure as a whole does not provide any critical showing to the claimed immersion time interval and absent any evidence of criticality, decreasing or increasing the immersion time of the packaging material in the liquid hydrogen peroxide is a matter of routine experimentation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified method in Ernstsson/Sizer with the heated hydrogen peroxide solution, because it is known that hydrogen peroxide

solution heated to a 60 ^{0}C temperature kills even heat-resisting germs as shown by Loliger (col.1, lines 31-33).

Loliger fails to teach that air said stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C. DiGeronimo sterilizes packaging material (col.1, lines 8-10) by immersing the material in a 30% hydrogen peroxide solution, followed by a hot air application step where the air is heated to a temperature from 150 ^{0}C to 155 ^{0}C (col.3, lines 11-15), because combining hydrogen peroxide with heat results in a greater log reduction in viable cells (col.4, lines 30-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified method in Ernstsson/Sizer/Loliger with the heated air, because combining hydrogen peroxide with heat results in a greater log reduction in viable cells as explained by DiGeronimo (col.4, lines 30-33).

6. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374) as applied to claim 33, and further in view of DiGeronimo (U.S.P.N. 4,494,357).

Ernstsson and Sizer fail to teach that the blown air is heated to a temperature from 80 ^{0}C to 150 ^{0}C. DiGeronimo sterilizes packaging material (col.1, lines 8-10) by immersing the material in a 30% hydrogen peroxide solution, followed by a hot air application step where the air is heated to a temperature from 150 ^{0}C to 155 ^{0}C (col.3, lines 11-15), because combining hydrogen peroxide with heat results in a greater log reduction in viable cells (col.4, lines 30-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified

method in Ernstsson/Sizer with the heated air, because combining hydrogen peroxide with heat results in a greater log reduction in viable cells as explained by DiGeronimo (col.4, lines 30-33).

7. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374) as applied to claim 40, and further in view of Kodera et al. (U.S.P.N. 4,366,125) and DiGeronimo (U.S.P.N. 4,494,357).

Ernstsson and Sizer fail to teach maintaining a trace quantity of hydrogen peroxide on the surfaces of the packaging sheet material and that the blown air is heated to a temperature from 80 ^{0}C to 150 ^{0}C.

Kodera sterilizes sheet material by combining hydrogen peroxide and UV light (col.1, lines 8-18), since such a combination produces a highly synergistic sterilization effect which is far greater than the sum of the sterilization effects of the two methods carried out independently (col.6, lines 18-24). Kodera further teaches that while a certain quantity (the certain quantity is considered the hydrogen peroxide coat that remains on the surfaces of the material as mentioned in col.2, lines 3-5) of hydrogen peroxide is present on the surfaces of the sheet material, the coated surfaces are irradiated with UV light (col.1, lines 67-68 and col.2, lines 1-6). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified method in Ernstsson/Sizer with the hydrogen peroxide coating/UV irradiation steps, since such a combination produces a highly synergistic sterilization effect which

is far greater than the sum of the sterilization effects of the two methods carried out independently as explained by Kodera (col.6, lines 18-24).

Kodera fails to teach that the blown air is heated to a temperature from 80 ^{0}C to 150 ^{0}C. DiGeronimo sterilizes packaging material (col.1, lines 8-10) by immersing the material in a 30% hydrogen peroxide solution, followed by a hot air application step where the air is heated to a temperature from 150 ^{0}C to 155 ^{0}C (col.3, lines 11-15), because combining hydrogen peroxide with heat results in a greater log reduction in viable cells (col.4, lines 30-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified method in Ernstsson/Sizer/Kodera with the heated air, because combining hydrogen peroxide with heat results in a greater log reduction in viable cells as explained by DiGeronimo (col.4, lines 30-33).

8. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Sizer et al. (U.S.P.N. 5,843,374) as applied to claim 33 and further in view of Clark et al. (U.S.P.N. 5,925,885).

Ernstsson and Sizer fail to teach the type of the UV light source provided. Clark irradiates packages with polychromatic UV light (col.1, lines 17-20), because such a source of UV light deactivates microorganisms on the outer surfaces of packages or within the packages (col.1, lines 18-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified method in Ernstsson/Sizer with polychromatic UV light, because such a source of UV light

deactivates microorganisms on the outer surfaces of packages or within the packages as shown by Clark (col.1, lines 18-20).

9. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstsson et al. (U.S.P.N. 3,884,012) in view of Kodera et al. (U.S.P.N. 4,366,125) and further in view of Sizer et al. (U.S.P.N. 5,843,374) and DiGeronimo (U.S.P.N. 4,494,357).

Ernstsson discloses a method for sterilizing (col.1, lines 7-8) a packaging sheet material in a filling machine for food packages (col.3, lines 28-30), the method comprising in the following order: applying a solution of hydrogen peroxide to the surface of a packaging material (col.4, lines 60-63 and figure 3:28 and 29), Said hydrogen peroxide solution having undisclosed concentration; applying a stream of air to the packaging sheet material (col.5, lines 2-3 and figure 3:30) so as to remove substantially all the hydrogen peroxide from the surface of the packaging material (Ernstsson teaches removing surplus hydrogen peroxide by providing air knives as explained in col.5, lines 2-3 while hydrogen peroxide residues are left to be latter removed at an additional evaporation step as further shown in col.5, line 1); irradiating the surface of the packaging sheet material with UV light (col.3, lines 65-66 and figure 3:11) comprising undisclosed wavelength value.

Ernstsson fails to teach the following: that while retaining only a trace quantity of hydrogen peroxide on said packaging sheet material irradiating the surface of the material with light; irradiating with a UV light having a wavelength between about 200nm

and 320nm; hydrogen peroxide solution having a concentration of 10% to 50%; and stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C.

Kodera sterilizes sheet material by combining hydrogen peroxide and UV light (col.1, lines 8-18), since such a combination produces a highly synergistic sterilization effect which is far greater than the sum of the sterilization effects of the two methods carried out independently (col.6, lines 18-24). Kodera further teaches that while a certain quantity (the certain quantity is considered the hydrogen peroxide coat that remains on the surfaces of the material as mentioned in col.2, lines 3-5) of hydrogen peroxide is present on the surfaces of the sheet material, the coated surfaces are irradiated with UV light (col.1, lines 67-68 and col.2, lines 1-6). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Ernstsson with the hydrogen peroxide coating/UV irradiation steps, since such a combination produces a highly synergistic sterilization effect which is far greater than the sum of the sterilization effects of the two methods carried out independently as explained by Kodera (col.6, lines 18-24).

Kodera fails to teach the following: irradiating with a UV light having a wavelength between about 200nm and 320nm; hydrogen peroxide solution having a concentration of 10% to 50%; and stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C.

Sizer irradiates the exterior surfaces of packaging material with KrCl excimer lamp (col.3, lines 4-6 and lines 8-9) at a wavelength of 222 nm (col.7, lines 36-38) in order to provide a uniform sterilization of the material (col.4, lines 9-10). In addition, Sizer sterilizes packaging material by applying hydrogen peroxide and UV light (col.1,

lines 7-12) where the concentration of liquid hydrogen peroxide ranges between 1% to 55% by weight (col.3, lines 16-26), since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light (col.3, lines 16-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified method in Ernstsson/Kodera with the KrCl excimer UV lamp because KrCl excimer UV lamps provide uniform sterilization of the material as shown by Sizer (col.4, lines 9-10) and to further provide the method in Ernstsson with liquid hydrogen peroxide having concentration values between 1% to 55% by weight, since within this concentration range hydrogen peroxide has a synergistic effect on microorganisms when combined with UV light as also explained by Sizer (col.3, lines 16-20).

Sizer fails to teach that the stream of air is heated to a temperature from 80 ^{0}C to 150 ^{0}C. DiGeronimo sterilizes packaging material (col.1, lines 8-10) by immersing the material in a 30% hydrogen peroxide solution, followed by a hot air application step where the air is heated to a temperature from 150 ^{0}C to 155 ^{0}C (col.3, lines 11-15), because combining hydrogen peroxide with heat results in a greater log reduction in viable cells (col.4, lines 30-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the modified method in Ernstsson/Kodera/Sizer with the heated air, because combining hydrogen peroxide with heat results in a greater log reduction in viable cells as explained by DiGeronimo (col.4, lines 30-33).

Response to Arguments

10. Applicant's arguments filed on 12/22/08 have been fully considered but they are not persuasive.

On pages 11-12 of the Remarks section; Applicant argues that Ernstsson teaches a heat evaporation step that occurs upstream of the UV irradiation element such that it is clear from the description of the Ernstsson method that the web is dried from all hydrogen peroxide residues prior to UV irradiation.

Ernstsson teaches applying a liquid solution of hydrogen peroxide to the surface of a packaging sheet material (col.4, lines 60-63 and figure 3:28 and 29) while any microorganisms on the surface of the packaging material absorb hydrogen peroxide. The specification only teaches of microorganisms without providing any significance and one of ordinary skill in the art would readily recognize that Ernstsson sterilizes the web material, because the surfaces of the material includes microorganisms that absorb the residual hydrogen peroxide left after the immersion step and also after the step of applying the air knives. The residue of hydrogen peroxide that is left after immersion in hydrogen peroxide bath and after applying heated air from air knives, is considered the hydrogen peroxide that is absorbed by the microorganisms prior to the step of UV irradiation. Ernstsson teaches removing surplus hydrogen peroxide by providing air knives as explained in col.5, lines 2-3 while hydrogen peroxide residues are left to be latter removed at an additional evaporation step as further shown in col.5, line 1; absorbed by or located adjacent to any microorganisms present on the packaging sheet material. Ernstsson further teaches irradiating the surface of the packaging sheet

material while retaining a residual or trace quantity of hydrogen peroxide (the residual hydrogen peroxide is considered the amount that is absorbed by any microorganisms present on packaging sheet material with) UV light.

All of Applicants' arguments on pages 12-15 of the Remarks section are directed toward the newly added features that have been addressed above. More specifically, the newly added Kodera reference ('125) address the synergistic advantage of maintaining a hydrogen peroxide coating on the surfaces of the packaging material and irradiating the coating with UV light.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571)272-1271. The examiner can normally be reached on M-F 9:00-5:30.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. C./

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797